

1963

CENSUS OF MINERAL INDUSTRIES

VOLUME III

INDEXES OF PRODUCTION

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# 1963

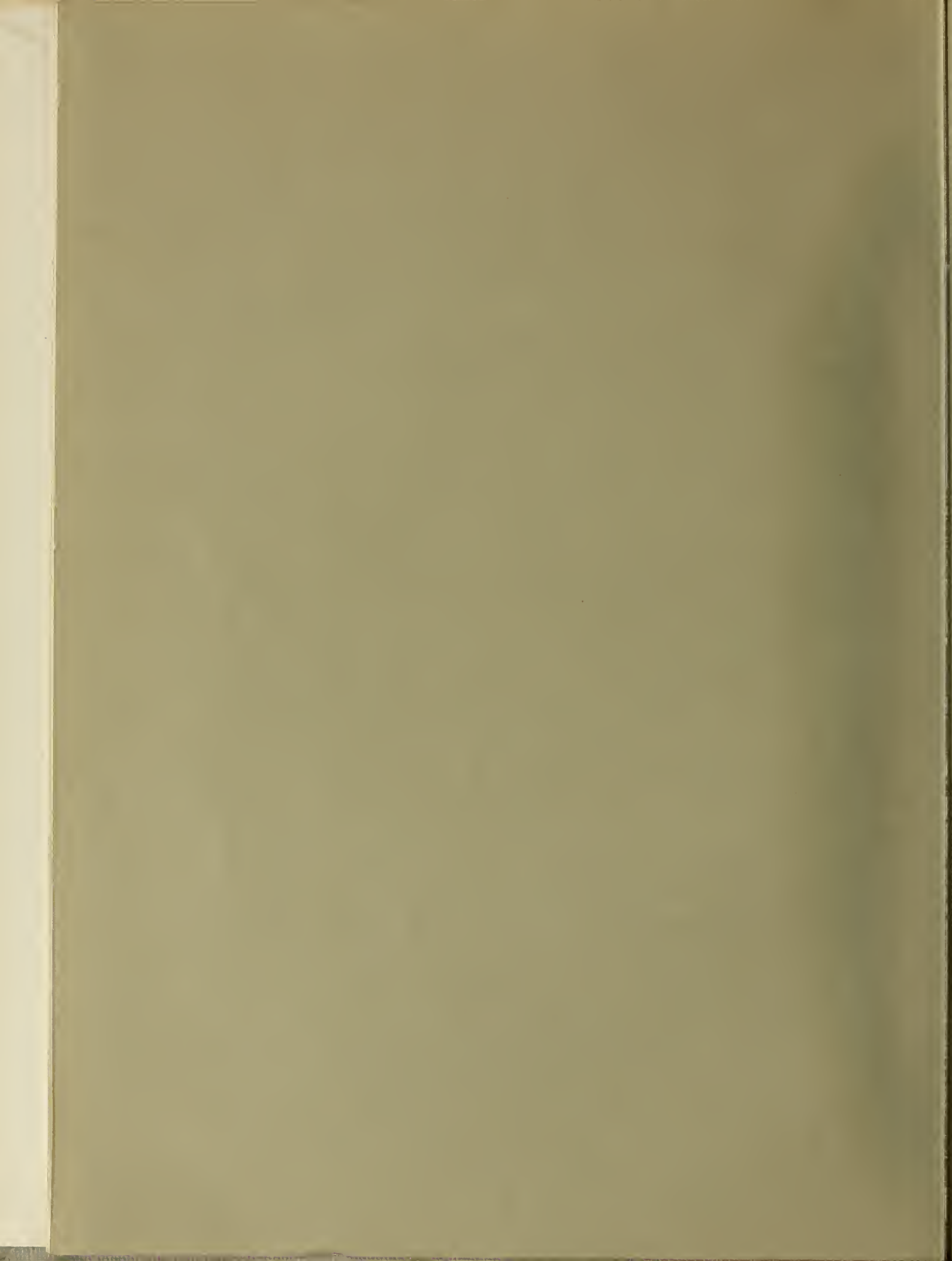
## CENSUS OF MINERAL INDUSTRIES



### III INDEXES OF PRODUCTION

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# 1963 CENSUS OF MINERAL INDUSTRIES

FOR RELEASE:  
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U.S. DEPARTMENT OF COMMERCE / Bureau of the Census

## Change Sheet

Volume III - Indexes of Production

The following changes should be made in the publication:

TABLE 2. Mining Production Indexes 1963, 1958, and 1954 from the Quinquennial Census  
Data, the Federal Reserve Board, and the Bureau of Mines  
(1958 = 100)

Code	Industry group	Census		Federal Reserve Board		Bureau of Mines	
		1963	1954	1963	1954	1963	1954
13	As published Oil and gas extraction.....	114.0	94.7	115.2	93.2	112.4	94.5
13	As revised: Crude petroleum and natural gas...	(NC)	(NC)	112.3	95.3	(NC)	(NC)

NC - No change

TABLE 3. Production Indexes and Weight Data for Mining Industries, 1963 and 1954

(The indexes for 1958 are 100.0 in every case)

Code	Industry groups	Indexes of production with value-added weights						Current-dollar weight data		
		1963 (1958 = 100)			1954 (1958 = 100)			Value added by manufacture* (millions of dollars)		
		Cross weights	1963 weights	1958 weights	Cross weights	1958 weights	1954 weights	1963	1958	1954

\*Value added by mining.

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### APPENDIX B. Industry Statistics Used for Weighting

Code	Industry group and industry	Employment, total (number)	Payroll, total (\$1,000)	Production worker man-hours (1,000)	Value added, adjusted (\$1,000)	Value of shipments (\$1,000)	Capital expenditures (\$1,000)	*Electrical energy used-KWK equivalent (1,000 kw.-hrs.)*	Electric energy used (1,000 kw.-hrs.)	Purchased new machinery installed (\$1,000)
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\*Energy used (KWK equivalent) (1,000 kw.-hrs.)

# 1963 CENSUS OF MINERAL INDUSTRIES

Volume III

## Indexes of Production



U.S. DEPARTMENT OF COMMERCE  
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## ACKNOWLEDGEMENTS

The production indexes derived from the 1963, 1958, and 1954 censuses of mineral industries were the product of joint efforts by the staffs of the Bureau of the Census and the Board of Governors of the Federal Reserve System. **Owen C. Gretton**, Chief of the Industry Division, Bureau of the Census, and **Clayton Gehman**, Chief, Business Conditions Section, Division of Research and Statistics of the Board of Governors were in general charge of the production index work. These mining indexes, the first prepared by the Census Bureau and the staff of the Federal Reserve in this detail, will appear concurrently with indexes of manufacturing production in future censuses. (The 1963 manufacturing indexes were published in June 1968).

Preparation and review of the data were carried out by **Louis J. Owen**, Assistant Chief, Production and Process Statistics, Industry Division, who also developed the system of computer programs to produce the required indexes. The procedures used were considerably influenced by the staff work of **Vivian Eberle Spencer**, Assistant to the Chief, Mineral Industries, Industry Division until February 8, 1969, and **Cornelia Motheral** of the staff of the Federal Reserve Board.

Assistance in the review of the data was provided by **Kenneth Armitage** and **Robert Torene** of the Federal Reserve; and by **John Berube**, Chief, Mineral Industries; **Frank Roy**, Metal, Mining, Oil and Gas; and **Patricia Horning**, Mineral and Coal, Industry Division, Bureau of the Census. Coordination, for the Division, of the various phases of the publication process was provided by **Angela R. Daly**.

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## **PREFACE**

This is the final volume in the series presenting the results of the 1963 Census of Mineral Industries. This volume, which is a joint effort of the Bureau of the Census and the Board of Governors of the Federal Reserve System, presents measures of change in mining output activity from 1954 to 1958 and from 1958 to 1963. This is the first set of such indexes prepared by the Census Bureau and based upon the detailed information available from its quinquennial Census of Mineral Industries. It constitutes an extension of the work on production indexes that had been carried out as part of earlier Census of Manufactures programs.

The 1963 mineral census data are provided in two basic volumes—Summary and Industry Statistics, and Area Statistics. That census was a large-scale undertaking in which important contributions were made by a large number of private and public individuals and organizations. Essential to the success of the census was the fine cooperation received from about 35,000 mineral establishments in completing the appropriate report forms.

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## CHAPTER 1.--INTRODUCTION

Between 1954 and 1963, mining production rose 22.2 percent from 94 percent of the 1958 average in the year 1954 to 114 percent in 1963, according to the cross-weighted Census-Federal Reserve benchmark indexes presented in this volume. These indexes for mining industries can be compared with the annual data from the Federal Reserve's monthly index for the period 1919-69, as shown in table 1. It is apparent that the 1954, 1958, and 1963 production levels are about in line with the long-run rate of expansion which averaged about 2.7 percent per year.

Benchmark indexes in the present volume have been developed by deflating and weighting in detail the value of output of 52 mining industries. The five major mineral industry groupings are shown in table 2 together with related Federal Reserve and Bureau of Mines data. Three sets of industry measures have been compiled, with weights derived from the price relationships of (a) the earlier year of each comparison period; (b) the later year of each comparison period; and (c) an average of both pairs of years (cross weights), as shown in table 3. In addition to value-added weighted indexes, measures of production have been compiled with special-purpose weights, such as employment and value of shipments. Measures of output per unit of various inputs and of dollar aggregates per unit of output have also been prepared.

The indexes are based mainly on data collected in the censuses of mineral industries for 1954, 1958, and 1963. Data are collected from the same establishments on labor and other inputs as well as output so that classification differences are not involved. Also, the censuses provide the most adequate data for comparison among the industries.

It should be recalled that the value-added (VA) measure in mining is calculated by combining shipments and capital expenditures minus cost of purchased machinery installed and from these subtracting other customary input items--supplies, minerals received from others, purchased fuels, electric energy, and contract payment. This variation is intended to recognize the amount of work done by the establishment or mine in the development of mineral properties. In the important

industry, 1311, Crude Petroleum and Natural Gas, accounting for more than one-half of the value added in all mining, a more direct way of measuring and including these development costs is available in costs of well drilling as reported in the census schedules. For that industry, the output figure used in these indexes is obtained by simply adding to net shipments the costs of wells drilled by the establishments classified in industry 1311. The cost of wells drilled is deflated with related average cost-per-foot data provided by the census.

In preparing the production indexes for other mining industries, a similar allowance was considered as an addition to the shipment figure. The allowance considered was capital expenditures minus purchased machinery installed. For some industries this might have made a more appropriate adjustment but in others there were good grounds to question the adjustment. Consequently, the estimates presented here, aside from industry 1311, are based on net shipments. Supplemental indexes, however, were calculated with the development cost adjustment and are shown in table 7, with the shipment indexes for comparison purposes.

The production indexes provide benchmarks for adjusting monthly and annual product and industry data available from other less comprehensive sources. A major use is to furnish a standard to determine output changes for individual series and subtotals in the Federal Reserve monthly industrial production index. In a forthcoming revision, the Federal Reserve Index will be adjusted to the 1958 and 1963 benchmarks observing such differences in classification, scope, and weights as are appropriate.

The Census production indexes and related series will also serve other purposes in the broad areas of analysis of national economic growth and cyclical changes, including studies bearing on the use of labor, materials, and power resources, plant capacity, and on price and wage changes. While reliable series are regularly available on oil and gas production and bituminous coal, to name the two largest industries, comparable data on cost of well drilling and on a large number of industries in metal mining and nonmetallic minerals are not elsewhere available in the detail provided here.

## MINING PRODUCTION SINCE 1919

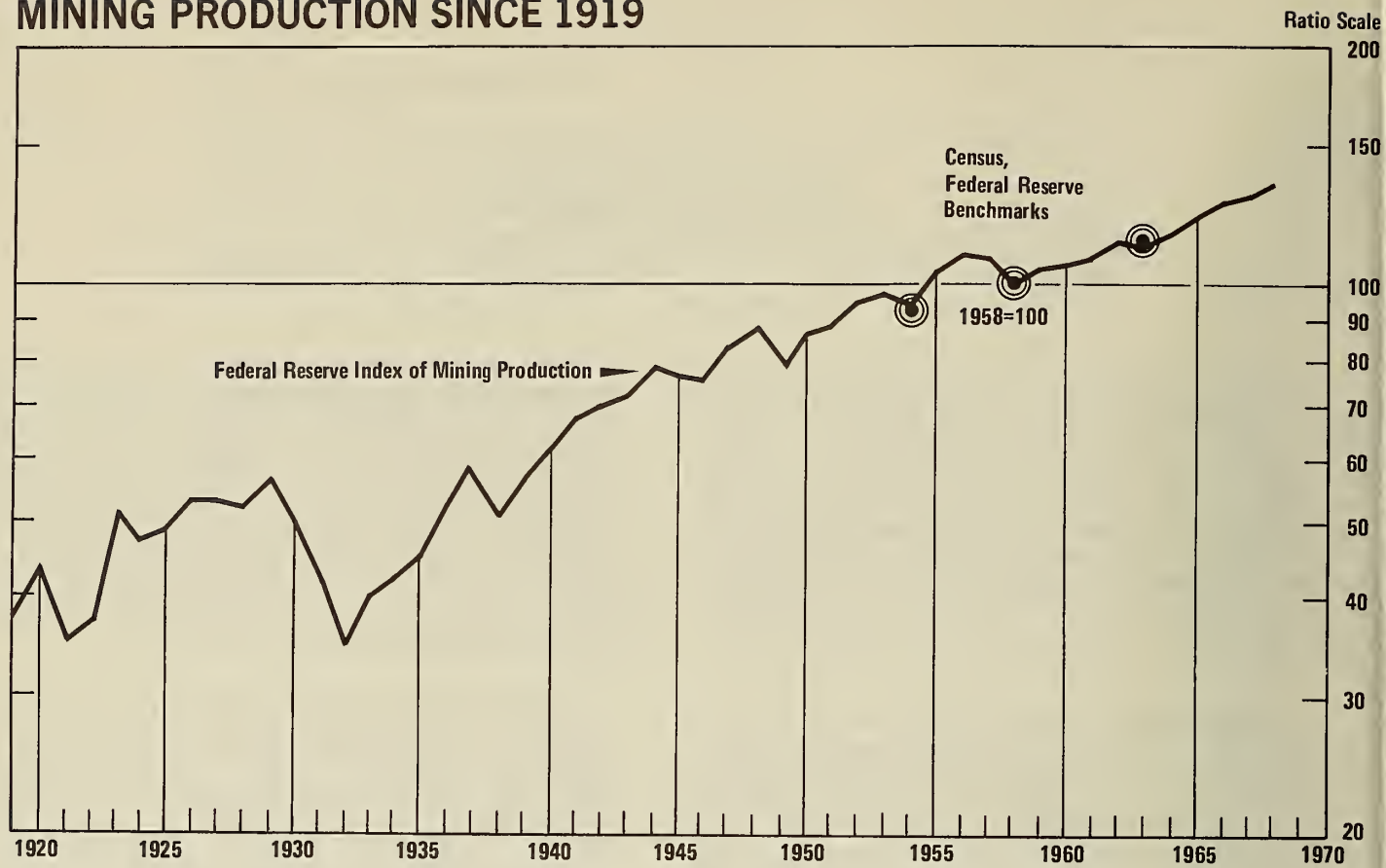




TABLE 1. Federal Reserve Board Mining Production Index 1919 to 1968 and Quinquennial Census Data 1954, 1958, and 1963

(1958=100)

Year	Federal Reserve monthly index	Year	Federal Reserve monthly index	Year	Federal Reserve monthly index
1919.....	37.6	1939.....	56.3	1959.....	104.3
1920.....	43.7	1940.....	62.9	1960.....	106.3
1921.....	35.0	1941.....	67.8	1961.....	107.3
1922.....	37.4	1942.....	70.1	1962.....	109.8
1923.....	51.7	1943.....	72.2	1963.....	112.8
1924.....	47.2	1944.....	77.6	1964.....	116.5
1925.....	48.6	1945.....	76.4	1965.....	120.0
1926.....	52.7	1946.....	75.5	1966.....	126.0
1927.....	52.9	1947.....	83.6	1967.....	129.5
1928.....	52.2	1948.....	87.9	1968.....	132.4
1929.....	56.7	1949.....	77.9		
1930.....	49.2	1950.....	87.0		
1931.....	42.2	1951.....	87.0		
1932.....	35.1	1952.....	94.6		
1933.....	40.3	1953.....	97.2		
1934.....	42.2	1954.....	94.4		
1935.....	45.7	1955.....	103.8		
1936.....	52.6	1956.....	109.6	1954.....	93.6
1937.....	59.3	1957.....	109.4	1958.....	100.0
1938.....	51.3	1958.....	100.0	1963.....	114.4

TABLE 2. Mining Production Indexes 1963, 1958, and 1954 from the Quinquennial Census Data, the Federal Reserve Board, and the Bureau of Mines

(1958=100)

Code	Industry Group	Census		Federal Reserve Board		Bureau of Mines	
		1963	1954	1963	1954	1963	1954
	All mining.....	114.4	93.6	112.8	94.3	116.9	92.8
10	Metal mining.....	117.7	88.2	117.8	86.0	113.9	104.1
11	Anthracite mining.....	76.1	132.5	89.4	124.1	86.3	137.4
12	Bituminous coal and lignite mining.....	110.6	93.0	111.9	96.4	111.8	95.4
13	Oil and gas extraction.....	114.0	94.7	115.2	93.2	112.4	94.5
14	Nonmetallic minerals, except fuels.....	112.7	87.7	116.3	86.7	122.6	83.1

Mineral indexes have been designed to provide measures of the change in the value of work done in establishments classified in each industry, valued in constant dollars to eliminate the effects of price changes. The measures for individual industries are combined to provide indexes for industry groups and total mining.

Census industry indexes were first compiled for manufacturing industries by Solomon Fabricant at the National Bureau of Economic Research for the years 1899 through 1939.<sup>1</sup> The Census Bureau and Federal Reserve staffs have compiled such indexes for the years since 1939, with the Bureau of Labor Statistics also collaborating on the 1947-54 measures. However, this is the first volume presenting comparable indexes for mining industries.

The techniques followed in deriving the present indexes for mining industries are comparable to those employed for the 1954 indexes prepared for manufacturing industries. That is, they are based on a single composite deflator for the entire industry in contrast to the 1958-63 manufactures indexes that were deflated on a 5-digit product class basis. The nature of mining industries, usually with one or two primary products and relatively unimportant secondary products and miscellaneous receipts, eliminates the need for many of the refinements introduced into indexes for manufacturing industries. Use of the electronic computer, however, has facilitated the calculation and publication of supplementary measures of production and related variables.

The very limited changes in the Standard Industrial Classification (SIC) System in mining made the task of compiling the indexes in mining simpler than in manufacturing. A single set of industry classifications, that will continue through the 1967 census, was observed (see appendix B, for weights employed).

### Methods of Measurement

The detailed Census quantity and value data for the products of mining, published in tables 6 of volume 1 of the mining census, are central to the construction of the production indexes. The weighted index of the quantity of products produced is fairly closely related to the measures of industry output where the products are primary.

In order to allow for the shipment of secondary products and miscellaneous receipts, as well as for products for which no quantity is reported, the industry indexes are computed by deflating the industry shipments with these product deflators.

Special note should be made for the quantities employed in major group 10 for metals other than iron. The output of copper, lead and zinc, and gold and silver mines are reported in terms of metal content. Typically, a mine produces two or more ores. The census information on metal content of ores plus average prices paid for these metals in census years were used to calculate a composite quantity in terms of dollars per pound of copper, lead, and zinc and per ounce of gold and silver. This composite quantity measure was used in preparing the deflators for these industries.

Gross indexes which are appropriate as measures of output for individual establishments become questionable at an industry level if there are significant and variable proportions of interplant transfers for further processing within the industry. In mining industries, these interplant transfers have become of increasing importance. This same problem exists in the manufacturing industries but is less significant for them. Moreover, there is no way to adjust readily for it in most manufacturing industries. For mineral industries, measures of net shipments are generally available and have been employed in these calculations.

Physical volume measures are generally available in mining so that production indexes, unlike those in manufacturing are almost completely based on reported quantity data. Nevertheless, there are some areas where quantities are lacking. These problems are handled by use of what is sometimes known as the coverage adjustment; that is, the values for products not covered by quantity data, are deflated with the deflators derived from the products covered by quantity and value data within the industries or at the next highest level of order in the SIC list. The deflated values obtained in this manner are included in the total product indexes.

### Choice of Deflators

To arrive at product and industry output measures reflecting both quantity and quality change, it is necessary to construct deflators that reflect, insofar as possible, "pure" price change for products of unchanging quality. The indexes presented here are calculated using deflators based almost entirely on Census unit values. Unit-value changes are accurate measures of price change to the extent that the composition or "mix" of a Census 7-digit product line is unchanged between the two census years. Changes in composition can include not only changes in the type or grade of product but also regional shifts and changes in the average size of transaction and terms of sale. In mining industries the principal problem has been the growing importance of intraindustry shipments for further processing. The substitution of net shipments has largely overcome this problem. The principal source used to supplement Census unit values is data from the Bureau of Mines

<sup>1</sup>The Output of Manufacturing Industries, 1899-1937, New York, 1940, and Employment in Manufacturing, 1899-1939, New York, 1942.

Mineral Yearbook. As in the compilation of the manufacturing indexes, the deflators were reviewed according to guide lines as follows:

1. To reexamine any unit-value relative showing a change greater than minus 30 or plus 40 percent. Unless special conditions confirmed the data, other Census or Bureau of Mines deflators were substituted.
2. To reexamine unit-value data whenever the census-derived unit-value relatives produced a questionable productivity change. The final indexes of output per production worker man-hour and per employee are shown in table 6.

#### Weighting

Deflated shipment values are still not satisfactory measures of constant-dollar industry net output or value added. For different products and different methods

of organizing production, a dollar's worth of output may represent 90 cents worth of value added by the producing establishment (as in oil and gas) or 60 cents worth (as in the oil and gas service and oil drilling).

The customary method of eliminating the effects of changes in the amount of duplication of production index compilation is the use of value-added weighting. For the mining indexes, the weights were assigned at the 4-digit industry level. The value-added weighted-output indexes presented here are considered reasonable measures of net output in mining. There are changes in product mix within some industries, particularly as a result of greater vertical integration, that is, the increased importance of processed mineral products. The changes in the efficiency of operations are more difficult to observe. These factors that may affect the reliability of the value-added weights should be recognized as possible limits on the accuracy of the indexes.



TABLE 3. Production Indexes and Weight Data for Mining Industries, 1963 and 1954

(The indexes for 1958 are 100.0 in every case)

Code	Industry groups	Indexes of production with value-added weights						Current-dollar weight data		
		1963 (1958 = 100)			1954 (1958 = 100)			Value added by manufacture (millions of dollars)		
		Cross weights	1963 weights	1958 weights	Cross weights	1958 weights	1954 weights	1963	1958	1954
	Mining, total.....	114.4	114.8	114.0	93.6	93.8	93.4	15,910	13,386	11,586
10	Metal mining.....	117.7	119.0	116.3	88.2	89.6	86.9	1,418	1,179	1,112
1011	Iron ores.....	122.2	125.9	118.8	105.9	107.1	104.5	549	488	436
1021	Copper ores.....	123.2	123.6	122.8	87.9	88.0	87.8	417	266	335
1031	Lead and zinc ores.....	106.1	107.2	104.9	109.7	110.1	109.4	84	74	107
104	Gold and silver ores.....	99.9	99.1	101.0	97.0	97.1	96.9	49	42	42
1042	Lode gold.....	83.1	80.1	86.5	90.5	90.5	90.5	21	23	22
1043	Placer gold.....	59.0	59.0	59.0	116.5	116.5	116.5	6	9	10
1044	Silver ores.....	168.6	167.8	169.5	94.9	94.5	95.4	22	10	10
1051	Bauxite.....	103.9	103.9	103.9	124.9	124.9	124.9	17	15	13
106	Ferroalloy ores.....	76.2	78.4	73.8	129.1	118.3	139.6	66	74	107
1062	Manganese ores.....	12.9	12.9	12.9	113.8	113.8	113.8	2	20	18
1069	Ferroalloy ores, n.e.c.....	96.2	96.2	96.2	133.9	120.0	146.3	64	54	89
1081	Metal mining services.....	98.0	98.9	97.0	119.6	121.4	117.8	25	23	27
109	Miscellaneous metal ores.....	128.4	128.6	128.3	20.5	21.6	19.7	210	196	45
1092	Mercury ores.....	50.1	50.1	50.1	49.9	49.9	49.9	3	7	3
1093	Titanium ores.....	150.7	150.4	150.9	104.6	103.9	105.4	15	13	11
1094	Uranium-radium-vanadium ores.....	130.2	130.2	130.2	14.3	14.3	14.3	191	175	30
1099	Metallic ores, n.e.c.....	94.0	94.0	94.0	35.1	35.1	35.1	2	2	1
11	Anthracite mining.....	76.1	76.0	76.3	132.5	132.2	132.9	121	164	197
111	Anthracite mining.....	76.1	76.0	76.3	132.5	132.2	132.9	121	164	197
1111	Anthracite.....	81.3	81.3	81.3	132.8	132.4	133.2	111	142	167
1112	Anthracite mining services.....	44.2	44.3	44.1	131.1	131.3	130.8	10	22	30
12	Bituminous coal and lignite mining.....	110.6	110.8	110.5	93.0	93.0	93.0	1,607	1,616	1,424
121	Bituminous coal and lignite mining.....	110.6	110.8	110.5	93.0	93.0	93.0	1,607	1,616	1,424
1211	Bituminous coal.....	110.5	110.6	110.4	93.0	93.0	93.0	1,578	1,591	1,403
1212	Lignite.....	120.5	120.5	120.5	100.6	100.6	100.6	12	9	9
1213	Coal mining services, n.e.c.....	119.2	121.3	117.4	88.0	88.0	88.0	17	15	13
13	Crude petroleum and natural gas.....	114.0	114.3	113.7	94.7	94.7	94.7	11,020	9,035	7,674
1311	Crude petroleum and natural gas.....	112.8	113.2	112.3	93.7	93.8	93.7	9,016	7,340	6,129
1321	Natural gas liquids.....	135.2	135.2	135.2	85.4	85.4	85.4	762	588	426
138	Oil and gas field services.....	111.3	111.3	111.3	105.6	105.7	105.5	1,241	1,108	1,119
1381	Drilling oil and gas wells.....	108.1	108.1	108.1	113.4	113.3	113.5	653	587	624
1382	Oil and gas exploration services.....	129.7	129.7	129.7	138.4	138.4	138.4	90	64	81
1389	Oil and gas field services, n.e.c.....	112.9	112.9	112.9	91.4	91.4	91.4	498	456	413
14	Nonmetallic minerals mining.....	122.7	122.6	122.8	87.7	87.5	87.9	1,745	1,392	1,179
1411	Dimension stone.....	134.5	133.6	135.3	96.6	96.0	97.1	15	13	15
142	Crushed and broken stone.....	124.1	124.2	124.0	74.4	74.6	74.3	582	449	338
1422	Crushed and broken limestone.....	122.8	122.8	122.8	76.1	76.1	76.1	408	335	240
1423	Crushed and broken granite.....	153.2	153.2	153.2	66.0	66.0	66.0	62	33	22
1429	Crushed and broken stone, n.e.c.....	116.7	116.7	116.7	71.7	71.7	71.7	112	81	77
144	Sand and gravel.....	115.9	115.6	116.3	92.7	91.6	93.9	514	435	358
1442	Construction sand and gravel.....	116.7	116.4	117.0	93.3	92.1	94.7	459	394	327
1446	Industrial sand.....	109.4	109.2	109.6	86.4	86.7	86.1	54	42	31
145	Clay and related minerals.....	137.9	137.5	138.3	102.3	102.1	102.7	114	87	78
1452	Bentonite.....	118.0	116.5	119.3	120.8	120.8	120.8	11	12	16
1453	Fire clay.....	86.1	85.9	86.4	113.6	113.6	113.6	13	15	17
1454	Fuller's earth.....	162.2	162.2	162.2	89.3	89.3	89.3	9	6	4
1455	Kaolin and ball clay.....	153.8	154.2	153.4	94.0	94.0	94.0	50	31	25
1456	Feldspar.....	138.2	140.0	136.5	90.4	90.4	90.4	6	5	4
1459	Clay and related minerals, n.e.c.....	156.9	155.0	158.4	99.7	101.2	97.1	24	19	11

TABLE 3. Production Indexes and Weight Data for Mining Industries, 1963 and 1954—Continued

(The indexes for 1958 are 100.0 in every case)

Code	Industry groups	Indexes of production with value-added weights						Current-dollar weight data		
		1963 (1958 : 100)			1954 (1958 : 100)			Value added by manufacture (millions of dollars)		
		Cross weights	1963 weights	1958 weights	Cross weights	1958 weights	1954 weights	1963	1958	1954
14	Nonmetallic minerals mining--Continued									
147	Chemical and fertilizer minerals.....	124.8	124.8	124.9	95.5	95.5	95.5	433	337	337
1472	Barite.....	132.5	134.4	131.1	144.2	144.0	144.4	11	11	14
1473	Fluorspar.....	80.9	80.9	80.9	96.2	96.2	96.2	9	13	10
1474	Potash, soda, and borate minerals.....	126.9	126.4	127.5	73.9	73.8	73.9	156	111	82
1475	Phosphate rock.....	138.2	138.4	138.0	88.5	89.6	87.6	95	64	62
1476	Rock salt.....	159.0	159.0	159.0	94.8	94.8	94.8	50	34	30
1477	Sulfur.....	106.6	106.6	106.6	119.4	119.4	119.4	100	94	124
1479	Chemical and fertilizer mining, n.e.c.....	115.9	115.9	115.9	95.9	95.9	95.9	12	10	15
1481	Nonmetallic minerals services.....	159.0	159.0	159.0	75.4	75.4	75.4	9	6	5
149	Miscellaneous nonmetallic minerals.....	122.4	123.4	121.3	88.4	88.8	88.0	78	63	48
1492	Gypsum.....	133.7	128.1	139.4	96.8	96.8	96.8	8	6	5
1493	Mica.....	80.6	109.1	60.0	63.3	63.3	63.3	4	5	3
1494	Native asphalt and bitumens.....	99.4	99.4	99.4	87.0	87.0	87.0	6	6	5
1495	Pumice and pumicite.....	108.3	108.3	108.3	94.7	94.7	94.7	4	4	3
1496	Talc, soapstone, and pyrophyllite.....	128.3	127.3	129.3	94.6	95.9	93.1	14	12	9
1497	Natural abrasives, except sand.....	132.9	132.9	132.9	119.6	119.6	119.6	4	3	3
1498	Peat.....	146.1	146.1	146.1	66.7	66.7	66.7	6	4	2
1499	Nonmetallic minerals, n.e.c.....	127.4	126.3	128.6	87.8	87.9	87.7	33	23	17

TABLE 4. Total Mining: Indexes of Production and Related Variables, 1963 and 1954

(The indexes for 1958 are 100.0 in every case)

Type of index	1963 (1958 : 100)			1954 (1958 : 100)		
	Cross weights	1963 weights	1958 weights	Cross weights	1958 weights	1954 weights
Index of production, value-added weights.....	114.4	114.8	114.0	93.6	93.8	93.4
Indexes of production with special-purpose weights:						
Value of shipments.....	114.2	114.6	113.8	93.4	93.6	93.3
Total employment.....	113.4	113.6	113.2	94.5	95.4	93.6
Total payroll.....	113.7	114.0	113.4	94.4	95.1	93.7
Production worker man-hours.....	113.6	113.7	113.6	94.2	95.3	93.3
Total energy used (kw.-hrs. equivalent)....	121.3	121.3	121.2	91.5	92.2	90.8
Electric energy used.....	117.2	117.9	116.4	93.0	93.6	92.3
Indexes of output per employee:						
Value-added weights.....	136.4	136.8	136.0	87.3	87.5	87.2
Employment weights.....	135.2	135.5	135.0	88.2	89.0	87.4
Indexes of output per production worker man-hour:						
Value-added weights.....	127.0	127.4	126.6	80.8	80.8	80.7
Man-hour weights.....	126.2	126.3	126.1	81.4	92.2	80.5
Indexes of output per unit of energy used:						
Value-added weights.....	104.9	105.2	104.5	101.8	101.9	101.6
Total energy weights.....	111.2	111.1	111.2	99.5	98.7	100.2
Indexes of output per kilowatt hour of electricity:						
Value-added weights.....	84.2	84.5	83.9	115.5	115.7	115.3
Electric energy weights.....	86.2	85.7	86.8	114.7	113.9	115.5
Indexes of unit value:						
Value of shipments per unit shipped.....	97.7	98.0	97.4	93.3	93.5	93.1
Value added per unit of output.....	103.9	104.2	103.6	92.5	92.6	92.3
Indexes of payroll per unit of output:						
Value-added weights.....	87.2	87.5	87.0	96.7	96.8	96.5
Payroll weights.....	87.8	88.0	87.6	95.9	96.6	95.1



TABLE 5. Special-Purpose Production and Unit Value Indexes, 1963 and 1954

(1958 = 100, cross weighted and the indexes for 1958 are 100.0 in every case)

Code	Industry group	Indexes of production with special-purpose weights												Indexes of unit value			
		Value of shipments		Total employment		Total payroll		Production worker man-hours		Electric energy used		Energy used		Value of shipments per unit shipped		Value added per unit of output	
		1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954
	Mining, total.....	114.2	93.4	113.4	94.5	113.7	94.4	113.6	94.2	117.2	93.0	121.3	91.5	97.7	93.3	103.9	92.5
10	Metal mining.....	117.4	85.3	114.6	87.9	115.7	88.8	114.0	86.5	118.8	94.3	118.3	82.2	100.7	101.7	102.3	107.0
1011	Iron ores.....	122.2	105.9	121.5	105.7	121.9	105.9	121.7	105.6	122.9	106.1	122.8	106.2	94.1	82.5	92.4	84.4
1021	Copper ores.....	123.2	87.9	123.1	87.9	123.2	87.9	123.2	87.9	123.2	87.9	123.1	87.9	118.0	124.5	127.1	143.0
1031	Lead and zinc ores.....	106.1	109.7	105.9	109.7	105.9	109.7	105.9	109.7	105.9	109.8	106.0	109.7	108.8	122.9	108.0	132.8
104	Gold and silver ores.....	98.6	97.6	97.1	96.5	97.8	97.3	94.7	97.3	96.8	99.7	76.4	103.5	114.6	103.3	116.3	103.1
1042	Lode gold.....	83.1	90.5	83.1	90.5	82.8	90.5	83.0	90.5	82.8	90.5	82.9	90.5	113.7	105.3	113.3	107.3
1043	Placer gold.....	59.0	116.5	59.0	116.5	59.0	116.5	59.0	116.5	59.0	116.5	59.0	116.5	101.1	100.5	107.9	97.0
1044	Silver ores.....	168.6	94.9	168.7	95.0	168.7	95.0	168.8	95.0	168.7	94.9	168.8	94.9	124.2	102.2	125.2	100.2
1051	Bauxite.....	103.9	124.9	103.9	124.9	103.9	124.9	103.9	124.9	103.9	124.9	103.9	124.9	113.4	73.9	108.9	66.5
106	Ferroalloy ores.....	74.3	128.0	64.8	126.2	69.5	127.6	63.5	127.7	75.6	126.8	55.8	123.1	105.1	101.6	117.1	113.7
1062	Manganese ores.....	12.9	113.8	12.9	113.8	12.9	113.8	12.9	113.8	12.9	113.8	12.9	113.8	63.1	69.2	90.6	79.6
1069	Ferroalloy ores, n.e.c.....	96.2	133.5	96.2	133.9	96.2	134.0	96.2	135.9	96.2	133.1	96.2	134.9	116.6	116.7	122.7	126.0
1081	Metal mining services.....	98.0	119.6	98.0	119.4	98.0	119.5	97.9	119.4	97.8	118.6	97.9	119.7	102.0	99.4	110.4	97.5
109	Miscellaneous metal ores.....	128.4	19.5	125.1	20.5	125.7	20.5	124.2	19.6	131.2	34.9	128.6	20.8	83.5	117.4	83.1	115.3
1092	Mercury ores.....	50.1	49.9	50.1	49.9	50.1	49.9	50.1	49.9	50.1	49.9	50.1	49.9	84.8	105.2	72.3	94.7
1093	Titanium ores.....	150.7	104.6	150.7	104.6	150.7	104.6	150.7	104.7	150.7	104.5	150.8	104.6	88.4	73.7	78.2	83.5
1094	Uranium-radium-vanadium ores	130.2	14.3	130.2	14.3	130.2	14.3	130.2	14.3	130.2	14.3	130.2	14.3	82.8	123.6	83.8	120.4
1099	Metallic ores, n.e.c.....	94.0	35.1	94.0	35.1	94.0	35.1	94.0	35.1	94.0	35.1	94.0	35.1	107.0	125.0	92.1	122.4
11	Anthracite mining.....	75.7	132.5	75.9	132.6	75.5	132.6	75.7	132.6	79.2	132.7	75.8	132.7	97.2	94.0	96.3	90.3
111	Anthracite mining.....	75.7	132.5	75.9	132.6	75.5	132.6	75.7	132.6	79.2	132.7	75.8	132.7	97.2	94.0	96.3	90.3
1111	Anthracite.....	81.3	132.8	81.3	132.8	81.3	132.8	81.3	132.8	81.3	132.8	81.3	132.9	96.7	94.0	95.6	88.5
1112	Anthracite mining services..	44.2	131.1	44.2	131.1	44.2	131.1	44.2	131.1	44.2	131.1	44.2	131.1	101.0	94.0	101.6	101.8
12	Bituminous coal and lignite mining.....	110.6	93.0	110.5	93.0	110.6	93.0	110.6	93.0	110.5	93.1	110.8	93.0	90.5	92.9	89.9	94.7
121	Bituminous coal and lignite mining.....	110.6	93.0	110.5	93.0	110.6	93.0	110.6	93.0	110.5	93.1	110.8	93.0	90.5	92.9	89.9	94.7
1211	Bituminous coal.....	110.5	93.0	110.4	93.0	110.5	93.0	110.5	93.0	110.5	93.0	110.5	93.0	90.4	92.9	89.8	94.7
1212	Lignite.....	120.5	100.6	120.5	100.6	120.5	100.6	120.5	100.6	120.5	100.6	120.5	100.6	105.1	93.5	105.4	97.1
1213	Coal mining services, n.e.c.	119.2	88.0	119.0	88.0	119.1	88.0	119.0	88.0	118.4	88.0	118.8	88.0	91.6	92.6	93.2	94.1
13	Crude petroleum and natural gas.....	113.8	94.9	113.4	97.8	113.5	97.4	113.4	99.1	118.3	92.4	122.5	91.5	98.0	91.9	107.0	89.7
1311	Crude petroleum and natural gas.....	112.8	93.7	112.7	93.7	112.8	93.7	112.7	93.7	112.9	93.7	112.8	93.7	98.7	91.1	108.9	89.1
1321	Natural gas liquids.....	135.2	85.4	135.2	85.4	135.2	85.4	135.2	85.4	135.2	85.4	135.2	85.4	84.6	96.5	95.9	84.9
138	Oil and gas field services....	111.0	106.7	111.7	106.1	111.6	106.3	111.6	106.2	111.3	109.5	109.7	109.0	99.9	94.5	100.7	95.6
1381	Drilling oil and gas wells..	108.1	113.4	108.1	113.4	108.1	113.4	108.1	113.4	108.1	113.3	108.1	113.4	99.9	94.6	102.9	93.7
1382	Oil and gas exploration services.....	129.7	138.4	129.7	138.4	129.7	138.4	129.7	138.4	129.7	138.4	129.7	138.4	100.0	94.3	107.8	91.3
1389	Oil and gas field services, n.e.c.....	112.9	91.4	112.9	91.4	112.9	91.4	112.9	91.4	112.9	91.4	112.9	91.4	100.0	94.3	96.7	99.1
14	Nonmetallic minerals mining.....	123.0	87.3	123.1	86.1	122.9	86.3	123.3	85.7	125.9	85.4	122.4	92.8	101.6	96.4	102.2	96.6
1411	Dimension stone.....	134.5	96.6	134.6	96.7	134.5	96.6	134.5	96.7	134.5	96.5	134.3	96.6	90.8	121.3	84.4	120.0
142	Crushed and broken stone.....	124.2	74.4	124.1	74.5	123.7	74.6	124.2	74.5	124.2	74.5	123.2	74.8	102.9	101.6	104.3	101.2
1422	Crushed and broken limestone	122.8	76.1	122.8	76.1	122.8	76.1	122.8	76.1	122.8	76.1	122.8	76.1	96.1	95.1	99.4	94.0
1423	Crushed and broken granite..	153.2	66.0	153.2	66.0	153.2	66.0	153.2	66.0	153.2	66.0	153.2	66.0	118.4	94.3	120.3	100.4
1429	Crushed and broken stone, n.e.c.....	116.7	71.7	116.7	71.7	116.7	71.7	116.7	71.7	116.7	71.7	116.7	71.7	123.1	131.8	117.7	131.7
144	Sand and gravel.....	115.9	92.6	116.0	92.7	116.0	92.7	116.0	92.8	115.3	92.0	115.1	91.9	103.3	91.0	101.7	88.5
1442	Construction sand and gravel	116.7	93.3	116.7	93.4	116.7	93.3	116.7	93.5	116.7	93.3	116.7	93.5	102.6	91.5	99.9	88.8
1446	Industrial sand.....	109.4	86.4	109.4	86.4	109.4	86.4	109.4	86.4	109.4	86.4	109.4	86.4	109.5	87.4	119.8	85.9
145	Clay and related minerals.....	138.6	101.9	138.9	100.1	139.3	100.4	140.0	99.7	146.6	98.4	148.3	100.2	95.3	83.3	94.2	87.7
1452	Bentonite.....	117.9	120.8	117.9	120.8	117.7	120.8	117.8	120.8	117.8	120.8	118.0	120.8	91.1	107.3	79.3	110.8
1453	Fire clay.....	86.1	113.6	86.2	113.6	86.1	113.6	86.2	113.6	86.1	113.6	86.2	113.6	106.5	105.4	100.9	105.8
1454	Fuller's earth.....	162.2	89.3	162.2	89.3	162.2	89.3	162.2	89.3	162.2	89.3	162.2	89.3	91.9	81.5	93.9	78.6
1455	Kaolin and ball clay.....	153.8	94.0	153.7	94.0	153.8	94.0	153.7	94.0	153.8	94.0	153.8	94.0	101.3	81.2	104.6	86.7
1456	Feldspar.....	138.2	90.4	137.8	90.4	138.0	90.4	137.8	90.4	138.2	90.4	138.1	90.4	95.0	107.3	97.9	98.8
1459	Clay and related minerals, n.e.c.....	156.8	99.8	157.1	99.6	156.9	99.9	157.1	99.6	156.9	100.1	156.7	100.0	84.7	52.2	81.5	58.8

See footnotes at end of table.

TABLE 5. Special-Purpose Production and Unit Value Indexes, 1963 and 1954—Continued

(1958 = 100, cross weighted and the indexes for 1958 are 100.0 in every case)

Code	Industry group	Indexes of production with special-purpose weights												Indexes of unit value			
		Value of shipments		Total employment		Total payroll		Production worker man-hours		Electric energy used		Energy used		Value of shipments per unit shipped		Value added per unit of output	
		1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954
14	Nonmetallic minerals mining--Continued																
147	Chemical and fertilizer minerals.....	125.4	94.8	126.2	92.4	126.0	91.9	127.1	92.4	129.8	86.2	118.3	98.8	99.5	101.0	102.9	104.7
1472	Barite.....	132.7	144.2	132.6	144.2	132.7	144.2	132.6	144.2	132.9	144.2	132.8	144.2	92.9	94.3	74.0	86.1
1473	Fluorspar.....	80.9	96.2	80.9	96.2	80.9	96.2	80.9	96.2	80.9	96.2	80.9	96.2	91.7	85.8	86.7	81.5
1474	Potash, soda, and borate minerals.....	126.9	73.9	127.0	73.9	126.9	73.9	127.0	73.9	126.9	73.9	127.0	73.9	107.2	103.4	110.7	100.2
1475	Phosphate rock.....	138.2	88.6	138.1	88.5	138.1	88.6	138.1	88.4	138.2	88.4	138.2	88.5	95.2	94.1	106.7	109.0
1476	Rock salt.....	159.0	94.8	159.0	94.8	159.0	94.8	159.0	94.8	159.0	94.8	159.0	94.8	89.2	90.7	91.5	92.9
1477	Sulfur.....	106.6	119.4	106.6	119.4	106.6	119.4	106.6	119.4	106.6	119.4	106.6	119.4	99.9	111.0	100.1	110.6
1479	Chemical and fertilizer mining, n.e.c.....	115.9	95.9	115.9	95.9	115.9	95.9	115.9	95.9	115.9	95.9	115.9	95.9	100.0	99.0	109.8	157.0
1481	Nonmetallic minerals services.	159.0	75.4	159.0	75.4	159.0	75.4	159.0	75.4	159.0	75.4	159.0	75.4	105.0	105.3	94.4	104.1
149	Miscellaneous nonmetallic minerals.....	122.2	88.2	120.7	86.1	122.3	88.1	121.1	86.4	122.0	88.5	123.1	87.6	103.5	87.6	102.2	86.4
1492	Gypsum.....	133.4	96.8	134.1	96.8	133.7	96.8	134.4	96.8	132.7	96.8	132.9	96.8	107.2	97.2	96.8	92.8
1493	Mica.....	82.1	63.3	76.4	63.3	80.6	63.3	77.6	63.3	85.9	63.3	83.4	63.3	107.1	104.0	94.5	104.3
1494	Native asphalt and bitumens.	99.4	87.0	99.4	87.0	99.4	87.0	99.4	87.0	99.4	87.0	99.4	87.0	106.5	91.8	107.0	93.8
1495	Pumice and pumicite.....	108.3	94.7	108.3	94.7	108.3	94.7	108.3	94.7	108.3	94.7	108.3	94.7	89.9	65.4	88.3	66.0
1496	Talc, soapstone, and pyrophyllite.....	128.3	94.6	128.4	94.4	128.3	94.5	128.4	94.3	128.3	94.6	128.4	94.5	91.6	83.4	91.1	85.4
1497	Natural abrasives, except sand.....	132.9	119.6	132.9	119.6	132.9	119.6	132.9	119.6	132.9	119.6	132.9	119.6	111.6	86.5	117.3	90.7
1498	Peat.....	146.1	66.7	146.1	66.7	146.1	66.7	146.1	66.7	146.1	66.7	146.1	66.7	115.3	79.8	105.8	74.1
1499	Nonmetallic minerals, n.e.c.	127.4	87.8	127.6	87.8	127.4	87.8	127.5	87.8	127.4	87.8	127.3	87.8	106.5	88.7	109.4	85.0

TABLE 6. Indexes of Output Per Unit of Labor and Power Input and Payroll Per Unit of Output, 1963 and 1954

(1958 = 100, cross weighted and the indexes for 1958 are 100.0 in every case)

Code	Industry groups	Output per employee				Output per production worker man-hour				Output per total energy used				Payroll per unit of output			
		Value-added weights		Employment weights		Value-added weights		Man-hour weights		Value-added weights		Total energy weights		Value-added weights		Payroll weights	
		1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954
	Mining, total.....	136.4	87.3	135.2	88.2	127.0	80.8	126.2	81.4	104.9	101.8	111.2	99.5	87.2	96.7	87.8	95.9
10	Metal mining.....	139.5	79.9	135.9	79.8	127.4	70.5	123.5	69.6	101.9	113.7	102.3	104.3	90.1	109.2	91.7	108.5
1011	Iron ores.....	159.4	93.3	159.1	93.3	141.3	79.3	141.0	79.3	75.9	198.4	75.7	198.3	78.2	87.7	78.4	87.7
1021	Copper ores.....	128.6	87.3	128.5	87.4	111.5	77.2	111.5	77.3	152.8	97.2	152.7	97.2	105.9	107.9	106.0	107.9
1031	Lead and zinc ores.....	126.4	74.4	126.3	74.4	120.1	66.6	120.0	66.7	111.8	77.1	111.7	77.1	85.5	119.6	85.6	119.5
104	Gold and silver ores.....	104.7	76.0	101.6	75.6	108.2	71.2	102.4	71.4	109.1	69.9	83.2	74.8	106.9	112.2	109.1	111.8
1042	Lode gold.....	89.6	76.5	89.5	76.5	84.1	69.5	84.0	69.5	77.3	49.1	77.2	49.1	134.0	110.8	134.2	110.8
1043	Placer gold.....	137.3	74.1	137.3	74.1	151.9	72.8	151.9	72.8	77.8	93.9	77.8	93.9	72.2	115.6	72.2	115.6
1044	Silver ores.....	114.3	74.8	114.5	74.8	126.3	74.9	126.5	74.9	135.3	128.9	135.6	128.9	90.7	110.5	90.5	110.5
1051	Bauxite.....	132.7	103.4	132.7	103.4	125.3	87.8	125.3	87.8	66.5	111.0	66.5	111.0	91.8	79.5	91.8	79.5
106	Ferroalloy ores.....	133.7	86.9	114.1	83.9	130.6	71.2	109.7	68.9	127.6	105.6	99.0	100.0	100.0	111.7	109.5	114.6
1062	Manganese ores.....	121.3	91.7	121.3	91.7	128.2	92.1	128.2	92.1	235.4	138.8	235.4	138.8	97.3	90.4	97.3	90.4
1069	Ferroalloy ores, n.e.c.....	111.7	81.7	111.7	79.7	103.6	60.1	103.6	58.6	63.0	70.0	63.0	68.3	113.0	123.5	113.0	126.6
1081	Metal mining services.....	97.0	85.4	97.0	85.5	104.3	78.4	104.2	78.5	105.5	113.6	105.4	113.7	117.4	105.5	117.5	105.4
109	Miscellaneous metal ores.....	154.4	41.2	150.2	39.5	155.2	40.1	150.0	37.1	129.3	35.2	129.5	34.1	79.9	189.6	81.6	199.3
1092	Mercury ores.....	103.4	71.9	103.4	71.9	100.5	72.6	100.5	72.6	119.7	82.6	119.7	82.6	117.9	126.9	117.9	126.9
1093	Titanium ores.....	145.4	119.4	145.4	119.4	108.1	102.4	108.1	102.4	170.3	123.4	170.3	123.5	94.5	78.7	94.4	78.6
1094	Uranium-radium-vanadium ores	155.1	32.6	155.1	32.6	160.6	31.8	160.6	31.8	124.8	26.4	124.8	26.4	78.2	230.0	78.2	230.0
1099	Metallic ores, n.e.c.....	135.0	70.5	135.0	70.5	149.2	58.2	149.2	58.2	90.0	131.7	90.0	131.7	100.7	119.7	100.7	119.7



TABLE 6. Indexes of Output Per Unit of Labor and Power Input and Payroll Per Unit of Output,  
1963 and 1954—Continued

(1958 = 100, cross weighted and the indexes for 1958 are 100.0 in every case)

Code	Industry groups	Output per employee				Output per production worker man-hour				Output per total energy used				Payroll per unit of output			
		Value-added weights		Employment weights		Value-added weights		Man-hour weights		Value-added weights		Total energy weights		Value-added weights		Payroll weights	
		1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954	1963	1954
11	Anthracite mining.....	147.4	80.7	146.7	80.7	120.2	84.8	119.5	84.7	109.6	71.5	109.0	71.5	82.7	109.8	83.6	109.8
111	Anthracite mining.....	147.4	80.7	146.7	80.7	120.2	84.8	119.5	84.7	109.6	71.5	109.0	71.5	82.7	109.8	83.6	109.8
1111	Anthracite.....	149.9	79.9	149.9	79.8	120.9	83.4	120.9	83.3	111.4	67.4	111.4	67.4	82.1	111.9	82.1	111.9
1112	Anthracite mining services..	125.2	86.6	125.3	86.6	110.3	94.2	110.4	94.2	93.3	114.9	93.3	115.0	94.5	97.9	94.4	97.8
12	Bituminous coal and lignite mining.....	155.3	79.8	155.3	79.8	136.3	76.4	136.3	76.4	102.5	90.4	102.7	90.3	75.3	103.1	75.3	103.1
121	Bituminous coal and lignite mining.....	155.3	79.8	155.3	79.8	136.3	76.4	136.3	76.4	102.5	90.4	102.7	90.3	75.3	103.1	75.3	103.1
1211	Bituminous coal.....	155.5	79.7	155.5	79.7	136.4	76.3	136.4	76.3	101.3	89.7	101.3	89.7	75.3	103.2	75.3	103.2
1212	Lignite.....	120.1	89.4	120.1	89.4	115.1	94.3	115.1	94.3	92.9	77.6	92.9	77.6	85.0	95.5	85.0	95.5
1213	Coal mining services, n.e.c.	139.0	92.5	138.9	92.5	129.9	91.2	129.8	91.2	175.1	121.9	174.9	121.9	80.2	94.1	80.3	94.1
13	Crude petroleum and natural gas.....	131.4	93.9	130.7	97.0	126.3	84.8	125.7	88.7	106.1	103.1	113.9	99.6	90.0	90.8	90.4	88.3
1311	Crude petroleum and natural gas.....	139.9	97.9	139.8	97.9	136.3	87.0	136.3	87.0	104.2	90.9	104.2	90.9	86.4	85.5	86.4	85.5
1321	Natural gas liquids.....	161.1	81.4	161.1	84.1	149.0	82.6	149.0	82.6	121.1	107.0	121.1	107.0	74.2	103.4	74.2	103.4
138	Oil and gas field services...	115.2	97.5	115.5	98.0	114.4	90.6	114.7	91.2	131.4	108.2	129.4	111.7	101.2	91.4	100.9	90.8
1381	Drilling oil and gas wells..	115.9	99.1	115.9	99.1	111.3	93.1	111.3	93.1	122.6	110.0	122.6	110.0	101.8	92.8	101.8	92.8
1382	Oil and gas exploration services.....	142.8	115.1	142.8	115.1	133.3	96.4	133.3	96.4	228.4	139.4	228.4	139.4	84.5	81.9	84.5	81.9
1389	Oil and gas field services, n.e.c.....	110.6	93.1	110.6	93.1	115.6	87.4	115.6	87.4	145.3	114.2	145.3	114.2	103.2	90.1	103.2	90.1
14	Nonmetallic minerals mining.....	120.4	92.1	120.8	90.4	118.1	83.7	118.7	81.8	103.0	97.3	102.7	103.0	97.1	92.3	96.9	93.9
1411	Dimension stone.....	143.9	69.1	143.9	69.1	129.9	60.5	130.0	60.5	64.2	91.8	64.2	91.8	81.9	125.4	81.9	125.4
142	Crushed and broken stone.....	119.7	82.9	119.7	83.0	117.0	75.0	117.1	75.0	99.8	90.2	99.1	90.6	97.3	103.0	97.6	102.8
1422	Crushed and broken limestone	124.4	84.9	124.4	84.9	118.4	77.4	118.4	77.4	125.7	105.8	125.7	105.8	91.0	98.6	91.0	98.6
1423	Crushed and broken granite..	124.8	85.6	124.8	85.6	125.0	75.8	125.0	75.8	71.9	89.9	71.9	89.9	99.8	103.7	99.8	103.7
1429	Crushed and broken stone, n.e.c.....	99.9	74.2	99.9	74.2	107.6	65.3	107.6	65.3	44.4	46.7	44.4	46.7	126.0	121.1	126.0	121.1
144	Sand and gravel.....	107.3	94.3	107.4	94.4	109.5	88.0	109.6	88.1	92.3	88.0	91.6	87.2	105.9	92.2	105.9	92.1
1442	Construction sand and gravel	107.6	94.0	107.6	94.1	110.6	88.4	110.6	88.5	92.9	88.6	92.9	88.7	104.6	93.0	104.5	92.9
1446	Industrial sand.....	105.2	98.0	105.2	97.9	99.6	84.8	99.7	84.7	86.9	82.0	86.9	82.0	119.1	84.0	119.1	84.1
145	Clay and related minerals....	145.5	109.1	146.5	106.6	136.4	99.2	138.5	96.6	88.6	167.7	95.2	163.6	84.6	71.6	83.7	73.1
1452	Bentonite.....	100.1	131.1	100.1	131.1	89.2	102.8	89.2	102.8	110.4	188.6	110.3	188.6	121.2	61.3	121.2	61.3
1453	Fire clay.....	129.6	84.2	129.6	84.2	116.3	80.5	116.3	80.5	183.8	144.6	183.8	144.6	88.9	96.5	88.9	96.5
1454	Fuller's earth.....	139.5	103.3	139.5	103.3	136.2	92.2	136.2	92.2	70.0	97.5	70.0	97.5	78.8	81.4	78.8	81.4
1455	Kaolin and ball clay.....	156.0	101.3	155.9	101.3	142.6	86.6	142.5	86.6	86.2	118.8	86.2	118.8	82.2	75.5	82.2	75.5
1456	Feldspar.....	170.0	83.2	169.7	83.2	167.1	75.2	166.8	75.2	113.2	112.5	113.0	112.5	74.0	99.3	74.2	99.3
1459	Clay and related minerals, n.e.c.....	159.9	155.3	160.1	154.5	162.0	152.8	162.3	152.0	96.7	230.1	96.9	228.9	76.4	49.0	76.3	49.3
147	Chemical and fertilizer minerals.....	131.7	98.9	133.2	95.7	127.7	84.4	130.0	81.8	118.7	101.5	112.5	105.1	89.8	84.2	88.9	87.7
1472	Barite.....	113.4	157.3	113.4	157.3	111.5	95.3	111.5	95.3	93.3	106.1	93.4	106.1	99.1	51.9	99.1	51.9
1473	Fluorspar.....	124.2	94.2	124.2	94.2	126.5	101.2	126.5	101.2	89.4	95.9	89.4	95.9	87.6	90.1	87.6	90.1
1474	Potash, soda, and borate minerals.....	119.9	77.8	120.0	77.8	118.7	72.5	118.8	72.6	129.6	107.4	129.7	107.4	99.5	110.2	99.4	110.2
1475	Phosphate rock.....	132.5	87.8	132.5	87.7	126.1	72.2	126.0	72.2	93.2	92.4	93.2	92.4	85.0	89.4	85.0	89.4
1476	Rock salt.....	129.1	97.7	129.1	97.7	130.9	86.2	130.9	86.2	130.4	71.9	130.4	71.9	91.3	82.2	91.3	82.2
1477	Sulfur.....	150.6	107.2	150.6	107.2	151.7	89.0	151.7	89.0	108.7	109.7	108.7	109.7	78.6	72.2	78.6	72.2
1479	Chemical and fertilizer mining, n.e.c.....	216.4	154.5	216.4	154.5	194.6	118.2	194.6	118.2	101.3	58.3	101.3	58.3	66.4	66.2	66.4	66.2
1481	Nonmetallic minerals services.	202.4	130.9	202.4	130.9	191.1	113.5	191.1	113.5	70.7	82.5	70.7	82.5	81.8	87.6	81.8	87.6
149	Miscellaneous nonmetallic minerals.....	126.3	86.4	124.6	84.1	120.4	83.5	119.2	81.6	91.4	102.7	91.9	101.7	99.0	98.1	99.1	98.5
1492	Gypsum.....	118.5	87.5	119.2	87.5	128.6	81.1	129.3	81.1	76.7	84.3	77.1	84.3	99.7	106.0	99.1	106.0
1493	Mica.....	147.2	64.8	152.5	64.8	132.4	63.8	137.1	63.8	81.3	125.6	84.2	125.6	97.8	105.6	94.4	105.6
1494	Native asphalt and bitumens.	109.3	73.3	109.3	73.3	99.9	64.5	99.9	64.5	66.2	65.9	66.2	65.9	99.6	109.0	99.6	109.0
1495	Pumice and pumicite.....	155.2	125.6	155.2	125.6	119.2	101.4	119.2	101.4	171.8	187.7	171.8	187.7	80.0	83.4	80.0	83.4
1496	Talc, soapstone, and pyrophyllite.....	130.1	83.2	130.2	83.1	131.8	77.9	131.9	77.8	130.0	108.8	130.1	108.6	97.1	98.2	97.0	98.3
1497	Natural abrasives, except sand.....	103.5	125.6	103.5	125.6	116.3	121.1	116.3	121.1	136.6	116.4	136.6	116.4	118.3	73.5	118.3	73.5
1498	Peat.....	112.7	73.5	112.7	73.5	94.5	64.2	94.5	64.2	140.7	60.6	140.7	60.6	94.9	109.9	94.9	109.9
1499	Nonmetallic minerals, n.e.c.	121.5	88.9	121.7	88.9	115.7	98.0	115.8	98.0	79.8	101.4	79.9	101.4	102.1	96.8	102.0	96.8



TABLE 7. Comparison of Product Indexes for Mining Industries With and Without an Allowance for Exploration and Development Activities, 1963 and 1954

Code	Industry	Index of production (cross-weighted) with value added weights (1958 = 100)			
		Based on shipments only		Based on shipments plus capital expenditures minus purchased machinery installed	
		1963	1954	1963	1954
	Mining, total.....	114.4	93.6	114.3	93.5
10	Metal mining.....	117.7	88.2	116.0	90.8
1011	Iron ores.....	122.2	105.9	128.8	111.0
1021	Copper ores.....	123.2	87.9	124.1	94.0
1031	Lead and zinc ores.....	106.1	109.7	107.0	108.2
104	Gold and silver ores.....	99.9	97.0	104.0	97.7
1042	Lode gold.....	83.1	90.5	87.6	91.6
1043	Placer gold.....	59.0	116.5	62.3	118.9
1044	Silver ores.....	168.6	94.9	170.8	93.4
1051	Bauxite.....	103.9	124.9	103.4	125.1
106	Ferroalloy ores.....	76.2	129.1	77.0	130.1
1062	Manganese ores.....	12.9	113.8	13.5	114.2
1069	Ferroalloy ores, n.e.c.....	96.2	133.9	96.8	135.1
1081	Metal mining services.....	98.0	119.6	96.1	121.1
109	Miscellaneous metal ores.....	128.4	20.5	99.9	19.7
1092	Mercury ores.....	50.1	49.9	49.9	50.3
1093	Titanium ores.....	150.7	104.6	145.5	122.0
1094	Uranium-radium-vanadium ores.....	130.2	14.3	98.7	13.0
1099	Metallic ores, n.e.c.....	94.0	35.1	96.4	40.2
11	Anthracite mining.....	76.1	132.5	76.5	129.4
111	Anthracite mining.....	76.1	132.5	76.5	129.4
1111	Anthracite.....	81.3	132.8	81.7	129.7
1112	Anthracite mining services.....	44.2	131.1	44.7	127.8
12	Bituminous coal and lignite mining.....	110.6	93.0	109.8	91.3
121	Bituminous coal and lignite mining.....	110.6	93.0	109.8	91.3
1211	Bituminous coal.....	110.5	93.0	109.6	91.3
1212	Lignite.....	120.5	100.6	124.1	101.8
1213	Coal mining services, n.e.c.....	119.2	88.0	120.8	87.9
13	Crude petroleum and natural gas <sup>1</sup> .....	114.0	94.7	114.2	94.8
1311	Crude petroleum and natural gas <sup>1</sup> .....	112.8	93.7	112.8	93.7
1321	Natural gas liquids.....	135.2	85.4	137.0	85.3
138	Oil and gas field services.....	111.3	105.6	112.2	106.7
1381	Drilling oil and gas wells.....	108.1	113.4	109.5	115.0
1382	Oil and gas exploration services.....	129.7	138.4	130.1	137.1
1389	Oil and gas field services, n.e.c.....	112.9	91.4	113.1	92.2
14	Nonmetallic minerals mining.....	122.7	87.7	122.7	85.7
1411	Dimension stone.....	131.5	96.6	126.5	97.8
142	Crushed and broken stone.....	124.1	74.4	124.3	72.4
1422	Crushed and broken limestone.....	122.8	76.1	122.9	73.4
1423	Crushed and broken granite.....	153.2	66.0	158.0	67.9
1429	Crushed and broken stone, n.e.c.....	116.7	71.7	115.6	70.2
144	Sand and gravel.....	115.9	92.7	115.1	89.6
1442	Construction sand and gravel.....	116.7	93.3	115.8	90.0
1446	Industrial sand.....	109.4	86.4	112.5	86.0
145	Clay and related minerals.....	137.9	102.3	136.5	102.2
1452	Montonite.....	118.0	120.8	119.0	120.5
1453	Fire clay.....	86.1	113.6	85.0	111.3
1454	Fuller's earth.....	162.2	89.3	160.9	85.8
1455	Kaolin and ball clay.....	153.8	91.0	152.8	96.1
1456	Feldspar.....	138.2	90.4	151.3	91.6
1459	Clay and related minerals, n.e.c.....	156.9	99.7	149.1	98.2

See footnotes at end of table.

TABLE 7. Comparison of Product Indexes for Mining Industries With and Without an Allowance for Exploration and Development Activities, 1963 and 1954—Continued

Code	Industry	Index of production (cross-weighted) with value added weights (1958 = 100)			
		Based on shipments only		Based on shipments plus capital expenditures minus purchased machinery installed	
		1963	1954	1963	1954
14	Nonmetallic minerals mining--Continued				
147	Chemical and fertilizer minerals.....	124.8	95.5	125.8	94.1
1472	Barite.....	132.5	144.2	128.5	135.1
1473	Fluorspar.....	80.9	96.2	77.4	93.0
1474	Potash, soda, and borate minerals.....	126.9	73.9	132.8	72.0
1475	Phosphate rock.....	138.2	88.5	146.5	92.3
1476	Rock salt.....	159.0	94.8	163.2	95.5
1477	Sulfur.....	106.6	119.4	98.4	114.6
1479	Chemical and fertilizer mining, n.e.c.....	115.9	95.9	117.4	99.4
1481	Nonmetallic minerals services.....	159.0	75.4	160.4	73.8
149	Miscellaneous nonmetallic minerals.....	122.4	88.4	122.6	87.8
1492	Gypsum.....	133.7	96.8	134.6	94.0
1493	Mica.....	80.6	63.3	78.6	63.3
1494	Native asphalt and bitumens.....	99.4	87.0	102.0	85.8
1495	Pumice and pumicite.....	108.3	94.7	105.8	92.7
1496	Talc, soapstone, and pyrophyllite.....	128.3	94.6	129.9	97.8
1497	Natural abrasives, except sand.....	132.9	119.6	141.4	126.0
1498	Peat.....	146.1	66.7	137.2	62.8
1499	Nonmetallic minerals, n.e.c.....	127.4	87.8	127.5	86.0

<sup>1</sup>All indexes for Industry 1311 here and in all other tables are based on shipments plus cost of wells drilled by establishments classified in the industry.

## TECHNICAL NOTES TO CHAPTER 2

This technical appendix presents the symbolic notation and formulas for each of the types of indexes published in this volume.

### SYMBOLS

Year subscripts:

- 0 - base year (1958)
- 1 - index year (1954 or 1963)

Q - quantities produced.

Price weights:

- P - gross value per unit of quantity.
- PVA - value added per unit of quantity.

Resource requirement weights:

- RTE - total employment per unit of quantity.
- RPR - total payroll per unit of quantity.
- RMH - production worker man-hours per unit of quantity.
- REU - total energy used per unit of quantity.
- REE - electric energy used per unit of quantity.
- RGC - gross value of capital assets per unit of quantity.
- RCE - capital expenditures per unit of quantity.

### DEFINITION OF AGGREGATES

Shown on page 14 is the type of symbolic notion for the aggregates used in the index calculation, with a brief general description of the method used for arriving at the aggregates (a) in calculating the 4-digit industry index and (b) in aggregating the 4-digit industry indexes to higher levels.

### SYMBOLIC NOTATION OF INDEX FORMULAS

The formulas for base year, index year, and cross weights are presented for the gross- and value-added weighted index only. For other indexes only the formulas for the cross weighted form are shown.

Index of production, gross value weights:

$$\text{Base year weights: } \frac{\sum Q_1 P_0}{\sum Q_0 P_0} \times 100$$

$$\frac{\sum Q_1 P_1}{\sum Q_0 P_1} \times 100$$

$$\text{Cross weights: } \frac{\sum Q_1 (P_0 + P_1)}{\sum Q_0 (P_0 + P_1)} \times 100$$

Index of production, value added weights:

$$\text{Base year weights: } \frac{\sum Q_1 PVA_0}{\sum Q_0 PVA_0} \times 100$$

$$\text{Index year weights: } \frac{\sum Q_1 PVA_1}{\sum Q_0 PVA_1} \times 100$$

$$\text{Cross weights: } \frac{\sum Q_1 (PVA_0 + PVA_1)}{\sum Q_0 (PVA_0 + PVA_1)} \times 100$$

Indexes of production with resource requirement weights, cross weighted only:

$$\text{Total employment: } \frac{\sum Q_1 (RTE_0 + RTE_1)}{\sum Q_0 (RTE_0 + RTE_1)} \times 100$$

--and so analogously with the other resource requirement weights.

Indexes of output per employee, cross weights:

$$\text{Value added weights: } \frac{\sum Q_1 (PVA_0 + PVA_1)}{\sum Q_0 (PVA_0 + PVA_1)} \div \frac{\sum Q_1 RTE_1}{\sum Q_0 RTE_0} \times 100$$

$$\text{Total employment weights: } \frac{\sum RTE_0 (Q_0 + Q_1)}{\sum RTE_1 (Q_0 + Q_1)} \times 100$$

--and so analogously with output per unit of other inputs.

Indexes of unit value, cross weighted:

Value of shipments per unit shipped:

$$\frac{\sum P_1 (Q_0 + Q_1)}{\sum P_0 (Q_0 + Q_1)} \times 100$$

$$\text{Value added per unit of output: } \frac{\sum PVA_1 (Q_0 + Q_1)}{\sum PVA_0 (Q_0 + Q_1)} \times 100$$

Indexes of payroll per unit of output, cross weighted:

Value added weights:

$$\frac{\sum Q_1 RPR_1}{\sum Q_0 RPR_0} \div \frac{\sum Q_1 (PVA_0 + PVA_1)}{\sum Q_0 (PVA_0 + PVA_1)} \times 100$$

$$\text{Payroll weights: } \frac{\sum RPR_1 (Q_0 + Q_1)}{\sum RPR_0 (Q_0 + Q_1)} \times 100$$

Symbolic notation of aggregate	Method of calculation
--------------------------------	-----------------------

$Q_0^P$  Gross value of output in year 0

$Q_0^{PVA}$  Value added in year 0

$Q_0^{RTE}$  Total employment in year 0

--and so analogously with the other weights, except for REU, REE, and RGC which are calculated at the 4-digit level only.

$Q_1^P$  Gross value of output in year 1

$Q_1^{PVA}$  Value added in year 1

--and so analogously with the other weights as above.

$Q_0^P$   $Q_1^P \div$  production index with  
year 1 gross value per unit  
of quantity weights  
$$\left( \frac{Q_1^P}{Q_0^P} \right)$$

$Q_0^{PVA}$   $Q_1^{PVA} \div$  production index  
with year 1 value added per  
unit of quantity weights  
$$\left( \frac{Q_1^{PVA}}{Q_0^{PVA}} \right)$$

--and so analogously with the other weights as above.

$Q_1^P$   $Q_0^P \times$  production index with  
year 0 gross value per unit  
of quantity weights  
$$\left( \frac{Q_1^P}{Q_0^P} \right)$$

$Q_1^{PVA}$   $Q_0^{PVA} \times$  production index  
with year 0 value added  
per unit of quantity weights  
$$\left( \frac{Q_1^{PVA}}{Q_0^{PVA}} \right)$$

--and so analogously with the other weights as above.



**APPENDIX A.--PRODUCTION AND UNIT-VALUE  
INDEXES FOR CLASSES OF PRODUCTS,  
1954, 1958, and 1963**

The indexes presented in the accompanying tables are computed on a product basis and as such are to be distinguished from the indexes shown in tables 1 to 7 which have been computed on an industry basis. The distinction becomes clear when it is recalled that an industry, by definition in the Standard Industrial Classification (SIC) system, represents an aggregation of establishments which specialize in the production of like products (known as their primary products and serving to classify the establishment in a particular SIC industry) but which sometimes produce other products as well (known as their secondary products). Since secondary products are relatively unimportant in mining, the differences in these wherever-made indexes and those presented in the volume on an industry basis are fairly limited.

The indexes in this appendix show the weighted-average changes in output and unit price for products (4-digit) and higher order summations (3- and 2-digit) as shown in table 6A's of the volume I industry chapters. Shipments of products to others in the industry for further processing are excluded.

In the industry chapters which presented the results of the 1963 Census of Manufactures, a table 6B was published to make available (simultaneously with the industry statistics and product data) a series of preliminary product indexes (1954=100) measuring changes in the levels of production and average unit value between 1954 and 1958 as well as between 1958 and 1963. These preliminary indexes appeared at the 4-digit level and for higher level product summations. Some of these preliminary wherever-made indexes are revised by the indexes shown in this appendix.

# APPENDIX A. Production and Unit Value Indexes for Products Produced by all Mining Establishments

## PART 1. 1963 AND 1958

Code	Product description	Indexes (1958 : 100)					
		Production (gross-value weights)			Unit value (average)		
		Cross weights	1963 weights	1958 weights	Cross weights	1963 weights	1958 weights
	Mining, total.....						
10	Metal mining.....	119.2	121.1	117.3	102.5	104.0	100.7
1011	Iron ores.....	121.7	125.4	118.4	94.1	96.6	91.2
1021	Copper ores.....	122.1	122.5	121.7	118.0	118.4	117.6
1031	Lead and zinc ores.....	99.2	100.2	98.0	108.8	110.0	107.6
104	Gold and silver ores.....	93.4	92.7	94.2	114.8	113.9	115.7
1042	Lode gold.....	79.4	76.6	82.7	113.7	109.0	117.7
1043	Placer gold.....	53.4	53.4	53.4	101.1	101.1	101.1
1044	Silver ores.....	159.2	158.5	160.0	124.3	123.8	125.0
1051	Bauxite.....	104.1	104.1	104.1	113.4	113.4	113.4
106	Ferroalloy ores.....	117.2	125.6	108.9	106.7	113.9	98.8
1062	Manganese ores.....	16.4	16.4	16.4	63.1	63.1	63.1
1069	Ferroalloy ores, n.e.c.....	155.1	155.1	155.1	116.6	116.6	116.6
109	Miscellaneous metal ores.....	132.1	131.8	132.3	84.3	84.2	84.3
1092	Mercury ores.....	50.7	50.7	50.7	84.8	84.8	84.8
1093	Titanium ores.....	154.0	153.7	154.3	88.4	88.3	88.6
1094	Uranium-radium-vanadium ores <sup>1</sup> .....	138.8	138.8	138.8	82.8	82.8	82.8
1099	Metal ores, n.e.c.....	91.2	91.2	91.2	106.7	106.7	106.7
11	Anthracite mining.....	76.8	76.7	76.9	97.2	97.0	97.3
111	Anthracite mining.....	76.8	76.7	76.9	97.2	97.0	97.3
1111	Anthracite.....	82.1	82.1	82.1	96.6	96.6	96.7
1112	Anthracite mining services.....	45.8	45.9	45.8	101.0	101.3	100.9
12	Bituminous coal and lignite mining.....	110.5	110.7	110.4	90.5	90.6	90.4
121	Bituminous coal and lignite mining.....	110.5	110.7	110.4	90.5	90.6	90.4
1211	Bituminous coal.....	110.5	100.6	110.4	90.4	90.5	90.3
1212	Lignite.....	117.7	117.7	117.8	105.1	105.1	105.1
13	Crude petroleum and natural gas.....	112.6	112.9	112.3	98.0	98.3	97.7
1311	Crude petroleum and natural gas.....	112.4	112.9	111.9	98.7	99.1	98.3
1321	Natural gas liquids.....	135.1	135.1	135.1	84.6	84.6	84.6
1381	Drilling oil and gas wells.....	104.8	104.8	104.8	99.9	99.9	99.9
14	Nonmetallic minerals mining.....	122.8	122.8	122.9	101.3	101.2	101.3
1411	Dimension stone.....	131.0	130.2	131.8	90.8	90.3	91.4
142	Crushed and broken stone.....	124.8	125.0	124.5	102.8	103.0	102.6
1422	Crushed and broken limestone.....	121.6	121.6	121.6	96.1	96.1	96.1
1423	Crushed and broken granite.....	145.5	145.5	145.5	118.4	118.4	118.4
1429	Crushed and broken stone, n.e.c.....	127.4	127.4	127.4	123.1	123.1	123.1
144	Sand and gravel.....	118.9	118.6	119.2	103.3	103.1	103.6
1442	Construction sand and gravel.....	119.3	119.0	119.5	102.7	102.4	102.9
1446	Industrial sand.....	115.7	115.4	115.6	109.5	109.3	109.7
145	Clay and related minerals.....	124.8	124.3	125.2	95.0	94.7	95.4
1452	Bentonite.....	114.4	113.0	115.8	91.1	90.1	92.3
1453	Fire clay.....	94.1	93.8	94.4	106.5	106.2	106.8
1454	Fuller's earth.....	162.1	162.1	162.1	91.9	91.9	91.9
1455	Kaolin and ball clay.....	139.5	139.8	139.1	101.3	101.5	101.0
1456	Feldspar.....	116.5	118.0	115.2	94.9	96.0	93.6
1459	Clay and related minerals, n.e.c.....	122.0	120.6	123.2	84.8	84.0	85.8

See footnotes at end of table.

**APPENDIX A. Production and Unit Value Indexes for Products Produced  
by all Mining Establishments—Continued**

**PART 1. 1963 AND 1958**

Code	Product description	Indexes (1958 : 100)					
		Production (gross-value weights)			Unit value (average)		
		Cross weights	1963 weights	1958 weights	Cross weights	1963 weights	1958 weights
14	Nonmetallic minerals mining--Con.						
147	Chemical and fertilizer minerals.....	123.4	123.3	123.5	98.6	98.6	98.8
1472	Barite.....	131.5	133.2	129.9	92.9	93.9	91.6
1473	Fluorspar.....	71.2	71.2	71.2	91.7	91.7	91.7
1474	Potash, soda, and borate minerals.....	125.6	125.1	126.2	107.2	106.8	107.7
1475	Phosphate rock.....	136.3	136.5	136.1	95.2	95.3	95.0
1476	Rock salt.....	161.0	161.0	161.0	89.2	89.2	89.2
1477	Sulfur.....	106.6	106.6	106.6	99.9	99.9	99.9
1479	Chemical and fertilizer mining, n.e.c....	132.6	132.6	132.6	92.2	92.2	92.2
1481	Nonmetallic minerals services.....	169.7	169.7	169.7	105.0	105.0	105.0
149	Miscellaneous nonmetallic minerals.....	122.9	124.1	121.8	103.5	104.4	102.4
1492	Gypsum.....	126.7	121.6	132.4	107.3	103.4	112.5
1493	Mica.....	75.6	100.4	55.2	105.8	149.0	81.9
1494	Native asphalt and bitumens.....	103.0	103.0	103.0	106.5	106.5	106.5
1495	Pumice and pumicite.....	110.7	110.7	110.7	89.9	89.9	89.9
1496	Talc, soapstone, and pyrophyllite.....	126.6	125.6	127.5	91.7	91.0	92.4
1497	Natural abrasives, except sand.....	127.7	127.7	127.7	111.6	111.6	111.6
1498	Peat.....	150.4	150.4	150.4	115.3	115.3	115.3
1499	Nonmetallic minerals, n.e.c.....	132.3	131.1	133.5	106.5	105.7	107.6

<sup>1</sup>Based on V<sub>3</sub> O<sub>8</sub> content of concentrates as reported by the Bureau of Mines. For 1958, the index represents approximately the period 1956 to 1958.

**APPENDIX A. Production and Unit Value Indexes for Products Produced  
by all Mining Establishments—Continued**

**PART 2. 1958 AND 1954**

Code	Product description	Indexes (1958 : 100)					
		Production (gross-value weights)			Unit value (average)		
		Cross weights	1958 weights	1954 weights	Cross weights	1958 weights	1954 weights
	Mining, total.....						
10	Metal mining.....	95.7	96.9	94.5	100.5	101.7	99.2
1011	Iron ores.....	105.5	106.7	104.1	82.4	83.4	81.4
1021	Copper ores.....	85.6	85.7	85.5	124.4	124.5	124.2
1031	Lead and zinc ores.....	109.7	110.1	109.4	122.7	123.1	122.4
104	Gold and silver ores.....	95.3	95.3	95.3	103.3	103.2	103.3
1042	Lode gold.....	89.6	89.6	89.6	105.2	105.2	105.2
1043	Placer gold.....	115.2	115.2	115.2	100.4	100.4	100.4
1044	Silver ores.....	89.3	88.8	89.7	102.1	101.6	102.6
1051	Bauxite.....	124.2	124.2	124.2	73.8	73.8	73.8
106	Ferroalloy ores.....	173.0	158.5	188.7	103.2	92.4	110.0
1062	Manganese ores.....	139.1	139.1	139.1	69.1	69.1	69.1
1069	Ferroalloy ores, n.e.c.....	187.0	168.1	205.2	118.4	104.0	126.9
109	Miscellaneous metal ores.....	23.6	25.4	22.2	114.1	117.1	102.2
1092	Mercury ores.....	51.1	51.1	51.1	105.1	105.1	105.1
1093	Titanium ores.....	94.7	94.1	95.5	73.6	73.1	74.1
1094	Uranium-radium-vanadium ores.....	14.1	14.1	14.1	123.6	123.6	123.6
1099	Metal ores, n.e.c.....	49.0	49.0	49.0	124.8	124.8	124.8



**APPENDIX A. Production and Unit Value Indexes for Products Produced  
by all Mining Establishments—Continued**

PART 2. 1958 AND 1954

Code	Product description	Indexes (1958 = 100)					
		Production (gross-value weights)			Unit value (average)		
		Cross weights	1958 weights	1954 weights	Cross weights	1958 weights	1954 weights
11	Anthracite mining.....	133.4	133.1	133.8	93.9	93.6	94.1
111	Anthracite mining.....	133.4	133.1	133.8	93.9	93.6	94.1
1111	Anthracite.....	133.3	132.9	133.8	93.9	93.5	94.2
1112	Anthracite mining services.....	134.0	134.3	133.8	94.0	94.2	93.8
12	Bituminous coal and lignite mining.....	92.9	92.9	92.9	92.8	92.8	92.8
121	Bituminous coal and lignite mining.....	92.9	92.9	92.9	92.8	92.8	92.8
1211	Bituminous coal.....	92.9	92.9	92.9	92.8	92.8	92.8
1212	Lignite.....	100.1	100.1	100.1	93.5	93.5	93.5
13	Crude petroleum and natural gas.....	96.2	96.2	96.2	91.7	91.8	91.7
1311	Crude petroleum and natural gas.....	94.7	94.7	94.6	91.0	91.1	90.9
1321	Natural gas liquids.....	85.4	85.4	85.4	96.4	96.4	96.4
1381	Drilling oil and gas wells.....	111.5	111.3	111.6	94.5	94.4	94.6
14	Nonmetallic minerals mining.....	84.2	84.1	84.3	96.9	96.8	97.1
1411	Dimension stone.....	119.1	118.3	119.8	121.4	120.5	122.0
142	Crushed and broken stone.....	73.5	73.7	73.4	101.2	101.3	101.0
1422	Crushed and broken limestone.....	75.1	75.1	75.1	94.9	94.9	94.9
1423	Crushed and broken granite.....	67.3	67.3	67.3	94.3	94.3	94.3
1429	Crushed and broken stone, n.e.c.....	70.3	70.3	70.3	131.7	131.7	131.7
144	Sand and gravel.....	81.1	80.4	81.9	90.3	89.6	91.3
1442	Construction sand and gravel.....	78.1	77.1	79.2	91.2	90.1	92.7
1446	Industrial sand.....	92.5	92.8	92.2	87.4	87.6	87.0
145	Clay and related minerals.....	84.9	84.4	85.5	83.9	83.4	84.5
1452	Bentonite.....	84.8	84.8	84.8	107.2	107.2	107.2
1453	Fire clay.....	106.2	106.2	106.2	105.3	105.3	105.3
1454	Fuller's earth.....	109.0	109.0	109.0	81.4	81.4	81.4
1455	Kaolin and ball clay.....	75.6	75.6	75.6	81.1	81.1	81.1
1456	Feldspar.....	93.1	93.1	93.2	107.2	107.2	107.2
1459	Clay and related minerals, n.e.c.....	76.8	77.9	74.7	52.3	53.2	51.1
147	Chemical and fertilizer minerals.....	97.6	97.6	97.7	99.3	99.3	99.4
1472	Barite.....	144.3	144.1	144.4	94.2	94.1	94.3
1473	Fluorspar.....	78.4	78.4	78.4	85.8	85.8	85.8
1474	Potash, soda, and borate minerals.....	81.3	81.2	81.3	103.2	103.2	103.3
1475	Phosphate rock.....	96.5	97.5	95.4	94.0	95.0	92.9
1476	Rock salt.....	89.5	89.5	89.5	90.7	90.7	90.7
1477	Sulfur.....	119.2	119.2	119.2	110.9	110.9	110.9
1479	Chemical and fertilizer mining, n.e.c.....	103.4	103.4	103.4	99.1	99.1	99.1
1481	Nonmetallic minerals.....	76.7	76.7	76.7	108.0	108.0	108.0
149	Miscellaneous nonmetallic minerals.....	89.4	90.0	88.9	87.7	88.3	87.2
1492	Gypsum.....	96.7	96.7	96.7	97.0	97.0	97.0
1493	Mica.....	66.9	66.9	66.9	103.9	103.9	103.9
1494	Native asphalt and bitumens.....	86.9	86.9	86.9	91.7	91.7	91.7
1495	Pumice and pumicite.....	106.5	106.5	106.5	65.3	65.3	65.3
1496	Talc, soapstone, and pyrophyllite.....	95.9	97.2	94.3	83.3	84.5	82.0
1497	Natural abrasives, except sand.....	118.3	118.3	118.3	86.4	86.4	86.4
1498	Peat.....	67.9	67.9	67.9	79.8	79.8	79.8
1499	Nonmetallic minerals, n.e.c.....	88.0	88.1	88.0	88.6	88.7	88.5



## APPENDIX B.--INDUSTRY STATISTICS USED FOR WEIGHTS, 4-DIGIT

This appendix presents the industry statistics which were used as weights in computing the principal indexes of production shown in this volume. There were relatively minor changes in the Standard Industrial Classification system for mining during the 1957 revision of the SIC. Basically, the list of industries to be used in the 1967 census were used with the exception that tungsten, industry 1064, is included with ferroalloys, n.e.c., industry 1069.

## APPENDIX B. Industry Statistics Used for Weighting

Code	Industry group and industry	Employment, total (number)	Payroll, total (\$1,000)	Production worker man-hours (1,000)	Value added, adjusted (\$1,000)	Value of shipments (\$1,000)	Capital expenditures (\$1,000)	Electrical energy used KWK equivalent (1,000 kw.-hrs.)	Electric energy used (1,000 kw.-hrs.)	Purchased new machinery installed (\$1,000)
	Mining, total.....1963..	615,572	3,742,469	972,983	15,910,015	18,811,631	3,263,415	442,413	28,143	1,127,018
	.....1958..	734,099	3,749,727	1,080,124	13,386,049	16,366,996	2,803,530	405,596	20,717	1,020,544
	.....1954..	786,726	3,392,771	1,251,211	11,586,457	14,255,233	2,723,543	373,088	16,789	1,213,057
10	Metal mining.....1963..	77,210	515,207	125,663	1,418,217	1,843,617	230,744	32,211	8,330	96,480
	.....1958..	91,514	485,665	136,098	1,179,012	1,560,827	214,733	27,891	6,063	70,002
	.....1954..	101,054	467,669	170,195	1,112,330	1,393,026	221,912	21,635	4,743	87,259
1011	Iron ores.....1963..	23,083	161,571	34,524	549,305	709,352	96,444	17,883	3,303	27,889
	.....1958..	30,113	169,043	39,926	487,667	617,925	42,603	11,106	1,878	18,483
	.....1954..	34,170	156,909	53,288	435,668	539,160	84,978	5,928	1,171	36,994
1021	Copper ores.....1963..	26,486	187,307	45,319	417,089	544,239	87,078	8,258	3,384	45,590
	.....1958..	27,642	143,501	41,021	266,485	374,428	44,874	10,239	2,640	19,191
	.....1954..	27,813	136,065	46,676	334,876	409,911	82,210	9,255	2,009	23,821
1031	Lead and zinc ores.....1963..	9,422	49,337	14,781	84,373	119,785	11,896	1,094	635	4,272
	.....1958..	11,227	54,397	16,734	73,679	103,843	8,619	1,153	699	2,920
	.....1954..	16,566	71,363	27,554	107,409	140,132	11,520	1,641	794	5,942
104	Gold and silver ores.....1963..	4,216	24,797	7,605	49,026	60,224	7,186	949	231	2,025
	.....1958..	4,415	23,217	8,230	42,146	53,283	3,812	1,036	193	1,682
	.....1954..	5,635	25,262	11,212	42,165	53,724	4,592	1,438	290	2,026
1042	Lode gold.....1963..	2,397	13,861	4,544	21,312	26,632	2,859	373	104	484
	.....1958..	2,586	12,447	4,602	22,659	28,234	1,728	347	93	764
	.....1954..	3,060	12,475	5,988	22,003	26,892	2,183	639	121	915
1043	Placer gold.....1963..	361	2,134	731	5,810	7,532	989	439	43	372
	.....1958..	840	5,013	1,882	9,123	12,628	928	579	45	617
	.....1954..	1,320	6,749	3,010	10,306	14,781	1,343	718	125	665
1044	Silver ores.....1963..	1,458	8,802	2,330	21,904	26,060	3,338	137	84	1,169
	.....1958..	989	5,757	1,746	10,364	12,421	1,156	110	55	301
	.....1954..	1,255	6,038	2,214	9,856	12,051	1,066	81	44	446
1051	Bauxite.....1963..	552	3,442	751	17,464	20,478	269	236	12	462
	.....1958..	705	3,606	905	15,430	17,374	1,408	151	9	1,483
	.....1954..	852	3,581	1,288	12,827	16,029	310	170	9	356
106	Ferroalloy ores.....1963..	3,102	20,365	4,867	66,407	83,719	5,831	551	251	1,453
	.....1958..	5,438	26,711	8,335	74,255	106,435	6,545	922	266	2,158
	.....1954..	8,078	38,535	15,122	107,399	136,937	15,519	1,128	330	8,475
1062	Manganese ores.....1963..	224	1,138	351	2,348	2,804	386	32	6	181
	.....1958..	2,099	9,036	3,475	20,014	34,330	2,190	582	94	1,085
	.....1954..	2,604	9,292	4,293	18,118	27,016	3,264	477	81	2,304
1069	Ferroalloy ores, n.e.c.....1963..	2,878	19,227	4,516	64,059	80,915	5,445	519	245	1,272
	.....1958..	3,339	17,675	4,860	54,241	72,105	4,355	340	172	1,073
	.....1954..	5,474	29,243	10,829	89,281	109,921	12,255	651	249	6,171
1081	Metal mining services.....1963..	2,206	13,923	4,018	24,736	32,357	3,039	316	2	3,784
	.....1958..	2,184	12,097	4,274	22,862	32,384	1,263	340	3	1,365
	.....1954..	3,059	15,268	6,519	26,703	38,539	2,400	358	13	2,049
109	Miscellaneous metal ores.....1963..	8,143	54,465	13,798	209,817	273,463	19,001	2,924	512	11,005
	.....1958..	9,790	53,093	16,673	196,488	255,155	105,609	2,944	375	22,720
	.....1954..	4,881	20,686	8,536	45,283	58,594	20,383	1,717	127	7,596
1092	Mercury ores.....1963..	316	1,839	610	2,569	3,658	317	54	9	128
	.....1958..	652	3,112	1,223	7,093	8,607	862	129	15	370
	.....1954..	453	1,972	841	3,355	4,519	515	78	6	226
1093	Titanium ores.....1963..	997	6,401	1,721	15,021	22,033	2,171	377	131	2,096
	.....1958..	962	4,496	1,234	12,746	16,531	2,483	426	96	1,831
	.....1954..	843	3,699	1,261	11,134	12,750	3,998	361	73	1,286
1094	Uranium-radium-vanadium ores.....1963..	6,665	45,219	11,251	190,629	124,738	15,929	2,446	366	8,555
	.....1958..	7,939	44,422	13,873	174,802	226,999	101,565	2,344	260	20,092
	.....1954..	3,467	14,568	6,227	30,000	40,000	14,793	1,266	45	5,336
1099	Metallic ores, n.e.c.....1963..	165	1,006	216	1,598	3,034	584	47	6	226
	.....1958..	237	1,063	343	1,847	3,018	699	45	4	427
	.....1954..	118	447	207	794	1,325	1,077	12	3	748

## APPENDIX B. Industry Statistics Used for Weighting—Continued

Code	Industry group and industry	Employment, total (number)	Payroll, total (\$1,000)	Production worker man-hours (1,000)	Value added, adjusted (\$1,000)	Value of shipments (\$1,000)	Capital expendi- tures (\$1,000)	Electric energy used KWK equivalent (1,000 kw.-hrs.)	Electric energy used (1,000 kw.-hrs.)	Purchased new machinery installed (\$1,000)
11	Anthracite mining.....1963..	11,786	58,835	19,544	120,540	172,064	15,111	2,696	434	9,059
	1958..	22,813	93,396	30,867	164,489	234,000	16,591	3,881	632	10,033
	1954..	37,462	135,929	48,266	196,835	291,408	10,494	7,189	840	9,270
111	Anthracite mining.....1963..	11,786	58,835	19,544	120,540	172,064	15,111	2,696	434	9,059
	1958..	22,813	93,396	30,867	164,489	234,000	16,591	3,881	632	10,033
	1954..	37,462	135,929	48,266	196,835	291,408	10,494	7,189	840	9,270
1111	Anthracite.....1963..	10,692	53,022	17,758	110,527	156,526	12,651	2,443	417	6,810
	1958..	19,712	79,473	26,409	142,198	199,214	12,804	3,347	602	6,317
	1954..	32,769	118,070	42,061	167,090	248,513	7,884	6,589	802	5,667
1112	Anthracite mining services.....1963..	1,094	5,813	1,786	10,013	15,538	2,460	253	17	2,249
	1958..	3,101	13,923	4,458	22,291	34,786	3,787	534	30	3,716
	1954..	4,693	17,859	6,205	29,745	42,895	2,610	609	38	3,603
12	Bituminous coal and lignite mining..1963..	133,862	762,263	217,642	1,606,688	2,100,721	218,340	16,153	5,061	197,860
	1958..	187,963	915,066	268,170	1,615,744	2,098,526	188,490	14,972	4,432	152,194
	1954..	219,206	877,415	326,457	1,424,161	1,812,781	120,087	15,411	3,760	122,318
121	Bituminous coal and lignite mining.....1963..	133,862	762,263	217,642	1,606,688	2,100,721	218,340	16,153	5,061	197,860
	1958..	187,963	915,066	268,170	1,615,744	2,098,526	188,490	14,972	4,432	152,194
	1954..	219,206	877,415	326,457	1,424,161	1,812,781	120,087	15,411	3,760	122,318
1211	Bituminous coal.....1963..	132,046	752,491	214,421	1,578,078	2,063,165	210,835	15,676	5,044	190,805
	1958..	185,933	905,041	264,779	1,591,321	2,065,892	184,262	14,372	4,383	147,732
	1954..	217,186	868,759	323,098	1,402,551	1,784,798	117,037	14,914	3,733	119,159
1212	Lignite.....1963..	512	2,760	884	11,830	13,981	4,633	144	14	4,336
	1958..	510	2,693	844	9,309	11,035	1,432	111	42	1,522
	1954..	574	2,588	901	9,093	10,387	639	144	25	607
1213	Coal mining services, n.e.c.....1963..	1,304	7,012	2,337	16,780	23,575	2,872	333	3	2,719
	1958..	1,520	7,332	2,547	15,114	21,599	2,796	489	7	2,940
	1954..	1,446	6,068	2,458	12,517	17,596	2,411	353	2	2,552
13	Crude petroleum and natural gas.....1963..	271,476	1,744,711	397,348	11,019,796	12,423,399	2,551,692	333,522	9,012	648,073
	1958..	312,881	1,700,342	440,181	9,035,289	10,656,032	2,193,876	310,313	5,829	655,097
	1954..	315,735	1,462,443	491,718	7,673,694	9,230,101	2,226,316	285,096	4,062	863,205
1311	Crude petroleum and natural gas.....1963..	145,244	1,016,431	166,305	9,016,372	9,878,611	2,209,930	148,769	6,007	421,250
	1958..	180,121	1,043,108	201,009	7,339,922	8,384,586	1,947,634	137,440	3,850	486,886
	1954..	172,506	835,740	216,581	6,129,213	7,070,062	1,898,454	141,655	2,592	621,048
1321	Natural gas liquids.....1963..	13,859	96,553	24,455	762,070	808,479	113,856	158,705	2,500	39,068
	1958..	16,514	96,319	26,947	587,580	706,915	94,930	142,130	1,495	39,836
	1954..	17,340	85,057	27,862	425,937	582,866	109,959	113,449	1,257	65,752
138	Oil and gas field services.....1963..	112,373	631,727	206,588	1,241,354	1,736,309	227,906	26,048	505	187,755
	1958..	116,246	560,915	212,225	1,107,787	1,564,531	151,312	30,743	484	128,375
	1954..	125,889	541,646	247,275	1,118,544	1,577,173	217,903	29,992	213	176,405
1381	Drilling oil and gas wells.....1963..	55,416	318,150	106,266	653,337	974,546	148,026	19,932	351	115,681
	1958..	59,411	289,243	109,470	587,440	902,721	102,018	22,617	400	84,457
	1954..	67,976	304,312	133,216	623,967	968,129	153,168	23,302	131	120,385
1382	Oil and gas exploration services.....1963..	8,683	47,828	16,246	89,988	111,704	11,726	539	136	10,064
	1958..	9,557	43,649	16,695	64,353	86,108	7,082	949	17	6,075
	1954..	11,488	49,467	23,978	81,301	112,429	6,742	942	9	6,537
1389	Oil and gas field services, n.e.c.....1963..	48,274	265,749	84,076	498,029	650,059	68,154	5,577	18	62,010
	1958..	47,278	228,023	86,060	455,994	575,702	42,212	7,177	67	37,843
	1954..	46,425	187,867	90,081	413,276	496,615	57,693	5,748	73	49,483
14	Nonmetallic minerals mining.....1963..	121,238	661,453	212,786	1,744,774	2,271,830	247,528	57,831	5,306	175,546
	1958..	118,928	555,258	204,808	1,391,515	1,817,611	189,840	48,539	3,761	133,218
	1954..	113,269	449,315	214,575	1,179,437	1,527,917	144,734	43,748	3,384	131,005
1411	Dimension stone.....1963..	2,156	7,844	3,820	14,842	19,199	1,114	283	27	4,446
	1958..	2,306	7,121	3,690	13,076	15,719	1,201	135	22	2,845
	1954..	3,224	8,625	5,893	15,155	18,418	947	142	20	2,664







































































































































































































































































































































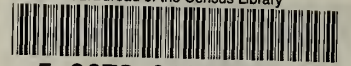




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